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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/779,125	02/07/2001	Masumi Sakai	0800239.0129	7697

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EXAMINER
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LAVARIAS, ARNEL C

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 03/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/779,125

Applicant(s)

SAKAI, MASUMI

Examiner

Arnel C. Lavarias

Art Unit

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-- Th MAILING DATE of this communication app ars on the cover sheet with th correspond nc address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 28 January 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 1/28/03 in Paper No. 9 have been approved.

### ***Response to Amendment***

2. The amendments to the specification of the disclosure in Paper No. 10, dated 1/28/03, are acknowledged and accepted.
3. The amendments to Claims 1-7 in Paper No. 10, dated 1/28/03, are acknowledged and accepted.
4. The addition of Claims 12-17 in Paper No. 10, dated 1/28/03, are acknowledged and accepted.

### ***Response to Arguments***

5. In view of the amendments made above to the claims, the Examiner respectfully withdraws the objections to Claims 3, 5, 7, and 10.
6. The Applicant argues that Egan fails to teach or reasonably suggest the heating control means for *digitally* controlling heating current for heating the tube, as recited in newly amended Claim 1. The Examiner agrees, and respectfully withdraws the rejections to Claims 1-11.

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7. The Applicant argues that Egan fails to teach or reasonably suggest the parameter setting means setting parameters according to conditions of measurement and thereby adjusting a response characteristic of the heating control means when the tube is heated by the heating control means, as recited in newly amended Claim 1. The Examiner respectfully disagrees. This recited limitation is essentially the definition of feedback, which is extremely well known in systems, whether electrical, mechanical, or thermal in nature. Additionally, Egan discloses such feedback mechanism, the condition of measurement being the thermal lag of the workhead and the response characteristic being the non-linear heating response characteristic of the atomizer (See col. 3, line 1-col. 6, line 7).

8. Upon further consideration, new grounds of rejections are made as follows.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Egan et al. in view of Pettit et al.

Egan et al. discloses a furnace-type atomic absorption spectrophotometer comprising a tube for heating a sample (See 2 in Figure 1; col. 3, lines 27-59), monitoring means for

monitoring temperature of the tube (See upper portion of Figure 1, minus the DC-AC Converter and workhead; circuitry around 21, including 12, R<sub>1</sub>, and 21 in Figure 5) and outputting a monitored value indicative of the monitored temperature (See 15 in Figure 5), heating control means (See lower portion of Figure 1, including the DC-AC Converter and workhead; Lower portion of Figure 5; Figure 6) for controlling heating current for heating the tube such that the monitored value will approach a specified target temperature value, and parameter setting means (See for example 7, 8, 9, 25, 'Ramp Rate' in Figure 5; col. 5, lines 5-17) for setting parameters according to conditions of measurement and thereby adjusting a response characteristic of the heating control means when the tube is heated by the heating control means (See col. 3, line 1-col. 6, line 7). Egan et al. additionally discloses the parameter setting means including an input device for allowing a user to input parameters (See 7, 8, 9, 25, 'Ramp Rate' in Figure 5; col. 4, lines 5-40), and an input device for allow a user to input a condition corresponding to the parameters (See 7, 8, 9, 25, 'Ramp Rate' in Figure 5; col. 4, lines 5-40). Egan et al. also discloses that the monitoring means monitors values indicative of the temperature of the tube (See 15 in Figure in Figure 5; col. 4, lines 52-68). Egan et al. lacks the heating control means *digitally* controlling heating current for heating the tube. However, Pettit et al. teaches a self-tuning digital PID controller for applications such as plastic extruders and continually operable furnaces and ovens (See col. 1, lines 20-44; col. 13, lines 46-62). In particular, the PID controller is able to determine the appropriate PID tuning parameters, which include that standard proportional, integral, and differential parameters (See Abstract; col. 7, lines 12-25), and set the system to utilize these parameters (See col.

7, line 12-col. 8, line 61). Additionally, the self-tuning PID controller includes a microprocessor and non-volatile electrically alterable read-only memory (See col. 9, lines 33-55) to digitally process and store the calculated parameters for later use. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the self-tuning PID controller, as taught by Pettit et al. in the furnace-type atomic absorption spectrophotometer as disclosed by Egan et al. One would have been motivated to do this to provide automated control of the determination of characteristic furnace parameters, as well as provide automated and self-tuning functions as the furnace characteristics change over time.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Egan et al. in view of Pettit et al. as applied to Claims 1-2 above, and further in view of Clishem et al.

Egan et al. in view of Pettit et al. discloses the invention as set forth above in Claims 1-2. Egan et al. in view of Pettit et al. additionally discloses the use of silicon controlled rectifiers (SCR's) in the heating control for the tube (See 17 in Figure 5 of Egan et al.; col. 4, lines 18-40). Egan et al. in view of Pettit et al. lacks the heating control means controlling the heating current by a phase control method and the quantity of a specified operation is a firing angle. However, Clishem et al. teaches that electrical furnaces can be temperature controlled using SCR's by controlling the firing angle (See Figure 6) of the SCR's, thus limiting the amount of current passing through the heating elements (See 80, 82 in Figure 5A and 5B; col. 4, line 26-col. 5, line 5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to control the firing angle of SCR's to adjust the amount of current provided to a furnace, as

taught by Clishem et al., in the furnace-type atomic absorption spectrophotometer as disclosed by Egan et al. in view of Pettit et al. One would have been motivated to do this to take advantage of the higher reliability provided by SCR's since they have no mechanical parts that would likely fail.

12. Claims 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Egan et al. in view of Pettit et al., and further in view of Schmider et al.

Egan et al. in view of Pettit et al. discloses the invention as set forth above in the previous rejections. Additionally, Egan et al. in view of Pettit et al. discloses the response characteristic being an indicial response characteristic at a time of raising temperature (See for example 7, 8, 9, 25, 'Ramp Rate' in Figure 5; col. 5, lines 5-17 of Egan et al.; disclosure of Pettit et al.). Egan et al. in view of Pettit et al. lacks the parameter setting means adjusting parameters according to kinds of elements to be detected. However, Schmider et al. teaches a flameless atomic absorption spectrophotometer apparatus and method wherein a control panel of a programmable digital controller is used to provide input parameters to control various aspects of the flameless atomic absorption spectrophotometer, such as numerical values for the temperatures, slope of the temperature ramps, duration of temperature plateaus, and gases used during the temperature ramping and plateaus (See col. 3, line 11-col. 4, line 26). The Examiner notes that the atomization of specific elements is highly dependent on the above parameters (i.e. the atomization of copper requires a set of parameters that is different from the atomization of calcium); hence one skilled in the art is certainly expected to adjust these parameters, whether manually or automatically, based on the

element to be analyzed. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the parameter setting means adjust parameters according to kinds of elements to be detected, as taught by Schmider et al., in the spectrophotometer of Egan et al. in view of Pettit et al. One would have been motivated to do this to increase the sensitivity and signal-to-noise ratio of the measurement system, while reducing interfering signals from other materials that may be present in the sample, such as volatile solvents, excess water, and other excess organic and inorganic materials.

### *Conclusion*

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias  
March 3, 2003

